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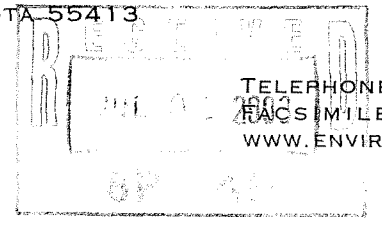

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VIA FACSIMILE AND
FEDERAL EXPRESS

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Region VIII
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Denver, CO 80202
Fax No. 303-312-6064

Re: Comments Regarding EPA's May 2003 Dispersion Modeling Analysis of PSD Class I Increment Consumption In North Dakota and Eastern Montana

Dear Mr. Long:

This letter and attached exhibits are Great River Energy's response to EPA's May 23, 2003 request for comments regarding EPA's report entitled "Dispersion Modeling Analysis of PSD Class I Increment Consumption in North Dakota and Eastern Montana (May 2003)" ("EPA's draft modeling report"). By Federal Register notice dated June 23, 2003 EPA directed that such comments be received on or before July 1, 2003.

I. Introduction And Summary

EPA's draft modeling report contends that SO_2 concentrations in Class I areas in North Dakota and Eastern Montana have increased and violate the PSD increments for such areas. The draft modeling report, however, is flawed, and does not constitute valid or accurate evidence of SO_2 concentrations or increment consumption. As discussed in detail below, EPA's draft modeling report: ignores actual measurements of SO_2 concentrations in the Class I areas; uses incorrect inputs for baseline emissions; assumes on increment consumption from plants that have no current emissions and fails to account for increment-expanding sources; does not use comparable data when comparing baseline and current emissions; overestimates increment consumption by assuming hypothetical worst-case emissions for 43,800 consecutive hours; fails to reflect variances; relies on outdated, irrelevant and inadequate meteorological data; attempts to predict concentrations for distances at which the model is proven to be inaccurate; uses a "paired-in-time" approach that the model is incapable of performing accurately; uses a model which is inaccurate if default settings are used; and presents modeling results that have not been appropriately validated.

Ultimately, there are no actual air quality data from ambient air monitors, emissions testing, or continuous emissions monitors that support EPA's draft modeling report's contention that SO_2 concentrations have increased above allowable amounts since the baseline period. All evidence of actual air measurements in North Dakota's Class I areas indicate that SO_2 emissions and SO_2 concentrations in those areas have decreased. In the past five years alone, SO_2 emissions from utility boilers in North Dakota have decreased by approximately 40,000 tons. Similarly, in the past five years, SO_2 emissions from all significant SO_2 emission sources in North Dakota have decreased by 60,000 tons. During 2002, the most recent full year of measurement of actual SO_2 concentrations in Theodore Roosevelt National Park, more than 90 percent of all measurements of ambient concentrations were below the minimum detectable level.

Of even greater significance, the relevant second-highest measured 3-hour concentration of SO_2 during the entire year of 2002 was 24 $\mu g/m^3$—below the 25 $\mu g/m^3$ 3-hour increment allowance. This fact alone--that it is impossible to show an increment violation based on actual measured concentrations in the Class I areas—demonstrates the flawed and inaccurate nature of EPA's draft modeling report. In short, EPA's draft modeling results are simply inconsistent with actual measured SO_2 concentrations. Accordingly, all established facts support the conclusion that EPA's draft modeling report is not valid or accurate evidence of SO_2 concentrations or increment consumption, that North Dakota's air quality has improved in its Class I areas, and that North Dakota's State Implementation Plan has adequately prevented significant deterioration.

II. Draft Modeling Conducted By EPA Is Not Valid Or Accurate Evidence of SO_2 Concentrations In Class I Areas, Or Increment Consumption In Class I Areas, And May Not Be Used To Contend Increment Violations

A. EPA's Modeling Uses the Incorrect Inputs for Baseline Emissions

EPA contends that, in estimating baseline emissions, the North Dakota Department of Health ("NDDH") may use only the estimated emissions for the two-year period immediately prior to the minor source baseline date for all sources in North Dakota and that the state may not use emissions that are considered more representative of a source's baseline emissions except in exceptional circumstances such as a strike or major catastrophe. See, EPA Comments on North Dakota Department of Health's Proposed Determination Regarding the Adequacy of the SIP to Protect PSD Increments for Sulfur Dioxide, (May 24, 2002) at 20-21. In contrast to EPA's position, the language in the applicable state regulation that is part of North Dakota's EPA-approved State Implementation Plan expressly authorizes use of a "more representative period" other than the two-year period immediately before the minor source baseline date for establishing baseline emissions. N.D.A.C. § 33-15-15-01(1)(a)(1). Nothing in the regulation limits the use of more representative emissions information in establishing baseline concentrations to only exceptional or "catastrophic" circumstances.

In addition to being consistent with applicable state law, NDDH's use of data from a "more representative period" is consistent with EPA's own guidance on this issue. For example, EPA's preamble discussion to the 1980 PSD rule amendments expressly allows for use of emissions "after the baseline" if they are "more representative" of a facility's emissions:

> If a source can demonstrate that its operation after the baseline date is more representative of normal source operation than its operation preceding the baseline date, the definition of actual emissions allows the reviewing authority to use the more representative period to calculate the source's actual emissions contribution to the baseline concentration. EPA thus believes the definition of actual emissions to allow any reasonably anticipated increases or decreases genuinely reflecting normal source operation to be included in the baseline concentration.

45 Fed. Reg. 52676, 52714 (August 7, 1980) (emphasis added). Similarly, the 1992 PSD rule amendments recognize the fluctuating nature of utility operations and provide that (in the PSD permitting context) emissions during a 5-year period may be used to establish representative emissions:

> A utility's normal operations means directly responding to a demand for electricity. A cold winter or hot summer will result in high levels of normal operations while a relatively mild year will produce lower normal operations. By presumably allowing a utility to use any 2 consecutive years within the past 5, the rule better takes into consideration that electricity demand and resultant utility operations fluctuate in response to various factors such as annual variability in climatic or economic conditions that affect demand, or changes at other plants in the utility system that affect the dispatch to a particular plant. By expanding the baseline for a utility to any consecutive 2 in the last 5 years, these types of fluctuations in operations can be more realistically considered, with the result being a presumptive baseline more closely representative of normal source operation.

57 Fed. Reg. 32324-32325 (July 21, 1992). Even EPA Region 8's recent comments to NDDH note that the phrase "in general" in EPA's and the NDDH's regulations "means that the [two-year average] definition [of actual emissions] applies in some, but not all circumstances." EPA Comments on North Dakota Department of Health's Proposed

Determination Regarding the Adequacy of the SIP to Protect PSD Increments for Sulfur Dioxide, (May 24, 2002), at 14.

Based on applicable law, EPA in any modeling of North Dakota's emission sources should, with the exception noted in section II(B) below, defer to NDDH's baseline emissions estimates as documented in NDDH's May 2003 report entitled "Prevention of Significant Deterioration Sulfur Dioxide Final Baseline Emission Rates," and described in NDDH's 2003 testimony regarding those emission estimates. See App. Ex. 7 and 1. EPA's attempt to supplant its narrow opinion for the judgment of NDDH regarding representative baseline emissions is counter to North Dakota law, EPA guidance, and the Clean Air Act's delegation of responsibilities which mandate that the state, not EPA, should decide representative baseline emissions. See, e.g., Alabama Power v. Costle, 636 F.2d at 364 (noting that increment decisions "were left by Congress for resolution by the states"). See also, 39 Fed. Reg. at 31001 (August 27, 1974) (where EPA notes "any policy to prevent significant deterioration . . . in the Administrator's judgment should not be handled at the Federal level, but should become a matter of discussion and decision making at the governmental level in close contact with the area.").

B. Baseline Emissions for Stanton Station Unit 1 Should be Based on Allowable Emissions

EPA's draft modeling, as well as that done by NDDH, use an inappropriately low number as an estimate of Stanton Station's baseline emissions. For any increment modeling, 24-hour and 3-hour baseline emissions for Stanton Station Unit 1 should be based on allowable emissions that are representative of "normal source operation" during the baseline period. North Dakota law includes in the definition of baseline concentration "actual emissions representative of sources in existence on the applicable minor source baseline date." NDAC 33-15-15-01d(1)(a). NDAC 33-15-15-01.1.a(2) defines "actual emissions" to include "source specific allowable emissions" and emissions that are "representative of normal source operation."

When considering the short-term 3-hour and 24-hour maximum standards, source specific allowable emissions accurately reflect "normal source operation" for Stanton Station Unit 1. Allowable emissions for Stanton Station Unit 1, as of the minor source baseline date, were based on the facility's 1800 mmBtu/hr heat input rating and a 3 lbs SO_2/mmBtu emission limit. Great River Energy previously provided EPA and NDDH documents, including Rural Electrification Administration and Annual Emission Inventory Forms, that confirm that Stanton Station Unit 1 exceeded 1,800 mmBtu/hr heat input during at least 37 different one-month periods between 1967 and 1981, including eight different periods from 1972 through 1977. Information provided by Great River Energy also documented that the facility, during the baseline period, fired coal on many occasions that emitted greater than 3 lbs SO_2/mmBtu (and as high as 4.62 lbs SO_2/mmBtu). See App. Ex. 8.

This information indicates that the facility's "actual" maximum short term 3-hour and 24-hour emissions rates of SO_2 during the baseline period were likely greater than the allowable emission rate of 5,400 lb/hr and supports the use of the facility's allowable emissions for establishing baseline emissions. Such a conclusion appears consistent with EPA's belief's regarding short-term emission rates at utilities. As noted by EPA in its May 2002 comments to NDDH:

> In the electric power industry emissions can vary hourly or daily depending upon the demand for power which is related to factors such as weather conditions or workday schedule. Because of these higher than average emission periods, an emission rate calculated over a full year is normally much less than the peak short term (3-hour or 24-hour average) emission rate given a source.

EPA Comments on North Dakota Department of Health's Proposed Determination Regarding the Adequacy of the SIP to Protect PSD Increments for Sulfur Dioxide, (May 24, 2002), at 14. Use of EPA estimates of emissions based on only the "two-year period" prior to the minor source baseline date for establishing baseline concentration would, for Stanton Station Unit 1, create an artificially low baseline concentration that is not representative of "normal source operation" prior to the baseline date, and could artificially reduce baseline such that the facility is viewed as consuming increment based

on nothing more than normal and expected emissions fluctuations. This result is counter to the legislative history of the Clean Air Act, which provides that baseline emissions should be established based on allowable emissions:

> "Baseline pollution level" is the level of pollution calculated to exist assuming plant capacities as of January 1, 1975 . . . . The committee emphasizes that the "baseline pollution level" includes existing sources' emissions calculated on the basis of total plant capacity. For example, even if a plant has been operating at 60 percent capacity, its total capacity for emissions is included in the "baseline . . . . Furthermore, no rollback in emissions from existing plants would be required under the provisions of this section.

H.R. Rep. 95-1175, 95th Cong., 1st Sess. (emphasis added). See also App. Ex. 8 (citing congressional and EPA documents that support use of allowable emissions for establishing baseline emissions). Accordingly, use of allowable emissions as the baseline emissions for the short-term 3-hour and 24-hour standards for Stanton Station Unit 1 is consistent with applicable law and established facts which show that the unit likely operated at or above its allowable emission level during the baseline period.

C. EPA's Draft Modeling Fails to Establish Baseline SO_2 Concentrations

EPA's modeling approach does not establish a baseline SO_2 concentration. Instead, EPA simply subtracts its contrived base year emissions from its worst-case (90th percentile) projected current emissions and models all emissions as increment consuming. This scheme contributes to EPA's flawed predictions concerning increment consumption. It also is counter to the plain language of the Clean Air Act that expressly defines the term "baseline concentration" as "the ambient concentration levels which exist at the time of [the minor source baseline date] based on available air quality data," and defines increment consumption in terms of "increases over the baseline concentration." See, 42 U.S.C. § 7479(4) and 42 U.S.C. § 7473(a).

D. EPA's Draft Modeling Assumes Increment Consumption from Plants that Have No Current Emissions and Fails to Account for Increment-Expanding Sources

EPA's draft modeling includes as increment consumers plants that have no current emissions, including the Grasslands and Lignite gas processing plants, and fails to consider appropriate increment expansion from the Lignite gas processing plant. As documented in NDDH's May 2003 modeling report entitled "Calpuff Analysis of Current PSD Class I Increment Consumption in North Dakota and Eastern Montana Using Actual Annual Average SO_2 Emission Rates," App. Ex. 10, at 43, these plants do not have SO_2 emissions. Compare EPA Draft Modeling Report, at 38 (attributing 383 lbs/hour of SO_2 emissions to these facilities). See also, Testimony of Lawrence Volmert, App. Ex. 1, at 166 (noting with respect to the Grasslands and Lignite gas plants that EPA is "pretending that there are emissions when there are in fact no emissions.").

E. EPA Does Not Use Comparable Data When Comparing Baseline and Current Emissions.

Comparison of AP-42 estimated emissions with present-day CEM data in the EPA analyses is arbitrary and yields an incorrect assessment of increment consumption. As Great River Energy documented and previously submitted to NDDH and EPA, analysis of CEM data and AP-42 emissions estimates for Stanton Station demonstrates that AP-42 emissions estimates result in lower predictions than measured by the CEMs. See App. Ex 8. See also Testimony of Tom Bachman, App. Ex. 1, at 23-31 (noting that "comparison of emission rates based on AP-42 is . . . not a fair comparison to emissions data from continuous emission monitors" and recommending adjustment of baseline emission to reflect the differences inherent to the different ways of predicting emissions).

Use of AP-42 to predict baseline emissions and CEM data to predict current emissions may make it appear that increment is consumed, when in fact actual emissions remain constant and the difference is attributable only to the varying prediction methods. This results in an inherently flawed analysis. Ironically, EPA's own 2002 draft modeling

report, while failing to consider this difference, makes the best case for the inequities that result by using different methods for comparing baseline and current emissions. According to the 2002 report:

> EPA believes that any increment analysis should follow the same methodology for determining emissions in the base year as in the current year . . . Using the same methodology allows an objective comparison . . . to do otherwise does not provide "comparable" data sets. If different methodologies were used to determine emissions for the base year and the current year, comparing the two data sets would produce inappropriate conclusions since the data sets had been derived using different methodologies.

EPA Dispersion Modeling Analysis of PSD Class I Increment Consumption in North Dakota and Eastern Montana, (January 2002), at 23. Any modeling comparison must at least be based on either the same method (e.g., AP-42) for assessing baseline and current emissions, or should adjust emissions estimates to reflect the bias inherent in the different methodologies. EPA has not done so and instead relies on an apples-to-oranges comparison to incorrectly contend that increment is being consumed.

F. EPA Overestimates Increment Consumption by Assuming Worst-Case Current Emission Levels for 43,800 Consecutive Hours

EPA further overestimates increment consumption by assuming worst-case 90th percentile current emission levels for 43,800 consecutive hours (24 hours per day over five years). EPA in this instance ignores its own modeling guidance, as well as the actual measured emissions from SO_2 sources, and contends that its use of the projected cumulative 90th percentile figure is appropriate because the 90th percentile "is the best representation of actual emissions." EPA Draft Modeling Report at 20. EPA's approach, however, ignores the extremely low probability that the highest short-term emissions from all relevant sources would occur at the same time as the most limiting meteorological conditions. The result is over-prediction of increment consumption. See, Testimony of George McVehil, App. Ex. 1, at 326 ("the probability of highest short term emissions occurring at all sources at the same time and in conjunction with the most limiting meteorological conditions is extremely low . . . . model results based on actual emissions, in combination with actual monitoring data, indicate that the higher

concentrations predicted by the conservative EPA modeling analysis are not currently occurring at the North Dakota Class I areas.").

G. EPA's Analysis and Contentions Fail to Recognize Variances and Prior Determinations of No Significant Deterioration

EPA's draft modeling analysis fails to reflect the variances granted to certain sources in North Dakota. There is no provision in the Clean Air Act that requires states to "make up" increment where a permit was issued pursuant to the alternative increment standards under section 165 of the Act. After twenty years of "silence" on this issue, EPA's recently adopted position is arbitrary and capricious. See Testimony of Richard Long, App. Ex. 2, at 88.

EPA's contention that the North Dakota State Implementation Plan is inadequate to prevent significant deterioration also is not supported when considering past certification by Federal Land Managers of no adverse impact on the Class I areas at SO_2 concentrations higher than predicted by EPA's draft modeling. For example, in 1993, the Federal Land Managers found that no significant deterioration in the North Unit of Theodore Roosevelt National Park would occur at a predicted SO_2 concentration level of 12.7 $\mu g/m^3$. See Final Certification of No Adverse Impact on Theodore Roosevelt National Park and Lostwood Wilderness Area, 58 Fed. Reg. 13639-01 (Mar. 12 1993). EPA's draft modeling now suggests a second highest predicted concentration of 11$\mu g/m^3$—below the concentration level already certified to have no adverse impact. See also Testimony of Terry O'Clair, App. Ex. 1, at 36 ("If it was okay to have no adverse impact at 12.7 and now the second high is at 11, you have to ask the question, is there really an adverse impact at this time."). For EPA to now contend that there has been significant deterioration also would be arbitrary and capricious.

H. EPA's Modeling Relies on Outdated and Inadequate Meteorological Data

EPA's modeling relies on meteorological data that is limited and outdated. Use of five years of meteorological data from the early 1990's is not the best, or even relevant, data

for assessing current concentrations of SO_2. This is not a prospective permitting proceeding, but rather a determination of whether SO_2 concentrations have actually increased in the Class I areas. EPA should use factual information and meteorological data concerning present day air quality to make such an assessment. EPA's decade-old data also does not represent state-of-the art meteorology, such as the RUC2 data that is recognized as an operational model and has been used for years by the National Weather Service in forecasting. See Testimony of Leon F. Osborne, Jr., App. Ex. 1, at 364. The limited nature of EPA's data further calls into question the validity of EPA's modeling effort.

Extensive testimony by metrological and modeling experts was presented at the June 12-13, 2003 hearing in Bismarck describing the inadequacies of EPA's meteorological data and how use of available and superior meteorological data would improve model accuracy. Use of the superior meteorological data would also reduce predicted increment consumption in the Class I areas at issue. See, e.g., Testimony of Walter Lyons, App. Ex. 1 at 190-227, Testimony of Bob Paine, App. Ex. 1, at 227-274, Testimony of George McVehil, App. Ex. 1, at 313-328, and Testimony of Leon Osborne, Jr., App. Ex. 1, at 332-364. See Also, Evaluation of 2003 Dispersion Modeling Analyses of PSD Class I Increment Consumption In North Dakota and Eastern Montana, App. Ex. 3, at § 2.4 (noting "the improved meteorological data provides predicted concentrations 20 to 40% lower" than use of EPA's outdated and limited data).

I. EPA Attempts to Use the CALPUFF Model to Predict Concentrations for Distances at which the Model is Proven to be Inaccurate

Evaluations of the CALPUFF model referenced in the Guideline on Air Quality Models demonstrate that CALPUFF over-predicts concentrations, especially at distances beyond 200 kilometers from a source. See Evaluation of 2003 Dispersion Modeling Analyses of PSD Class I Increment Consumption In North Dakota and Eastern Montana, App. Ex. 3, at § 2.3. EPA and IWAQM have stated that the model is only appropriate for modeling impacts at distances up to 50-200 kilometers. See, e.g., 65 Fed. Reg. 21539 (April 21, 2000). Here, EPA is attempting to use the CALPUFF model to guess at ambient

concentrations at distances well over 200 kilometers. As discussed in the testimony of Robert J. Paine, IWAQM's own research indicates that CALPUFF over-predicts concentrations by a factor of 3 to 4 for such longer distances. Testimony of Robert J. Paine, App. Ex. 2, at 401. This is notable, for example, when considering that all of the North Dakota utility sources are located more that 250 kilometers from the Medicine Lakes Wilderness Area and the Fort Peck Reservation for which EPA is alleging increment violations based solely on the CALPUFF model. See also, Evaluation of 2003 Dispersion Modeling Analyses of PSD Class I Increment Consumption In North Dakota and Eastern Montana, App. Ex. 3, at § 2.3 (further describing that CALPUFF model predictions are biased toward over-prediction).

J. EPA Uses a "Paired-in-Time" Approach to Assess Increment Consumption that the CALPUFF Model is Incapable of Performing Accurately

EPA also is using a "paired-in-time" approach to assess increment consumption that the CALPUFF model is incapable of performing accurately. EPA's approach to assessment of increment relies on the CALPUFF model to predict the difference between current and baseline concentrations at each receptor, event-by-event. See, e.g., Testimony of Richard Long, App. Ex. 2, at 72-73. The CALPUFF model, however, when using such an event-by-event or "paired-in-time" approach for multiple sources is incapable of accurately predicting emissions. See App. Ex. 3 at § 2.5 and App. Ex. 6, at 5. See also testimony of Kirk Winges, App. Ex. 2, at 356-59 (describing "horrible" and "very poor" model performance when using EPA's "paired-in-time" approach), App. Ex. 1 at 121-144 (further testimony by Winges regarding model's inaccuracy if used on a "paired-in-time" basis), and App. Ex. 10 (depicting model evaluation and poor performance of the CALPUFF model when a "paired-in-time" approach is employed). Even EPA, in its modeling guidelines included at 40 C.F.R. Part 51, Appendix W, § 10.1.2, concedes that "estimates of concentrations that occur at a specific time and site, are poorly correlated with actual observed concentrations and are much less reliable." Thus, EPA's draft modeling that uses CALPUFF and a paired-in-time approach may not be used to contend an increment violation. Because the CALPUFF model is incapable of accurately

predicting emissions on a paired-in-time basis, any attempt by EPA to use such an approach to contend an increment violation would be arbitrary and capricious.

K. The CALPUFF Model is Inaccurate

Modeling is not a real measurement of air quality--it is a prediction--a guess. Modeling is imprecise. EPA uses a "factor of two" test as its measure of whether a model is sufficiently close to real concentrations. A factor of two means the model can be wrong by as much as the entire standard at issue and still be considered "accurate" by EPA's modeling standards. Here, the CALPUFF model is inaccurate--beyond a factor of two--if EPA were to use IWAQM's recommended default settings for the model. As noted by EPA in its recent draft modeling report, "had the IWAQM defaults been used in the State's limited performance evaluation, it appears that model performance would have been degraded, with the model exhibiting a bias toward overprediction." EPA's Draft Modeling Report at 15. See also, Evaluation of 2003 Dispersion Modeling Analyses of PSD Class I Increment Consumption In North Dakota and Eastern Montana, App. Ex. 3, at § 2.3 ("If utilized with the options generally recommended by EPA (default values), CALPUFF would likely overestimate observed impacts by more than a factor of two, and thereby fail EPA's test for acceptable model accuracy."). The fact that the model, as intended to be run, is wildly inaccurate, highlights its limited probative value. Accordingly, EPA may not rely on the model's results to contend an increment violation.

L. EPA Has Not Provided Any Validation of its Draft Modeling

EPA has not provided any validation of its most recent draft modeling. None of the validation studies that were used to support the CALPUFF model were conducted based on the settings EPA employed in its 2003 modeling, and none of these studies were done for the time-frame, meteorological data or location of the modeling here. See Testimony of George McVehil, App. Ex. 1, at 313-328. Further, EPA's reliance on NDDH's limited validation review does not make sense. The validation review by NDDH was conducted using year 2000 data; EPA modeled using years 1990-1994. Additional deficiencies in

the validation review conducted by NDDH, such as the failure to perform certain standard diagnostic analyses, are discussed in detail in the testimony of Richard Londergan and the attached Earth Tech Modeling Report. See, Testimony of Richard Londergan, App. Ex. 2, at 566-571, and Earth Tech Modeling Report, App. Ex. 6, at 4-5.

Review of NDDH's limited validation review by Earth Tech, the company that developed the CALPUFF model, indicates that had an appropriate validation assessment been conducted, the assessment would have further indicated unacceptable model performance. For example, Earth Tech's review indicates exceptionally poor model performance when comparing seasonal patterns of observed and predicted peak concentration values. Earth Tech Modeling Report, App. Ex. 6, at 4-5 (noting "the majority of peak observed impacts occur in the winter, while only 4 of 34 peak predictions occur in winter."). Earth Tech's review of the validation assessment also indicates that the model results in a "systematic overprediction bias for peak concentrations." Earth Tech Modeling Report, App. Ex. 6, at 9. See also, Evaluation of 2003 Dispersion Modeling Analyses of PSD Class I Increment Consumption In North Dakota and Eastern Montana, App. Ex. 3, at § 2.3 ("It can be concluded that there is no evidence to suggest that any CALPUFF model results underestimate impacts, and all model predictions of North Dakota increment consumption are overestimated by varying amounts.").

No available information supports that EPA's modeling is valid or accurate. To the contrary, all evidence suggests that it is not. Common sense dictates that model performance should be evaluated based on settings and meteorological data actually used in any modeling. Further, in light of the improving trend in monitored SO_2 concentrations, any modeling that produces results contrary to actual observations should be checked against such actual air quality data. As courts considering model validity have repeated, a "model will be sustained only where it bears a rational relationship to the characteristics of the data to which it is applied," and EPA must "back up" any modeling with "checks against real world data." State of Ohio v. EPA, 784 F.2d 224 (6th Cir. 1986); citing Northern Ohio Lung Assoc. v. EPA, 572 F.2d at 1182. EPA has not done

so here. See also, Appalachian Power Co. v. EPA, 249 F.3d 1032, 1053-54 ("model assumptions must have a rational relationship to the real world" and noting that EPA must "explain the assumptions and methodologies used in preparing the model" and "provide a complete analytical defense should the model be challenged.").

III. Use Of Monitored SO_2 Concentrations To Assess Baseline Concentrations And Increment Consumption Is Appropriate Under Applicable Law And Guidance, Is The Best Available Air Quality Data, And Is Evidence Of Improving Air Quality In North Dakota

Under the Clean Air Act, the term baseline concentration is defined to include:

> The ambient concentration levels which exist at the time of the first [PSD permit application] based on air quality data available in the Environmental Protection Agency or a state pollution control agency and on such monitoring, as the permit applicant is required to submit.

42 U.S.C. § 7479(4). The only actual "air quality data available" for North Dakota's Class I areas is from the ambient air monitors located in North Dakota's Class I areas, which have taken thousands of measurements over more than twenty years. See Assessment of Trends in Measured Ambient Sulfur Dioxide Concentrations Within Theodore Roosevelt National Park (hereinafter "SO_2 Monitoring Report"), App. Ex. 4, at 5-7. Data has been collected from monitors in three separate locations inside Theodore Roosevelt National Park North and South Units. Id. at 3. This data is of high quality and from EPA-approved monitors that have experienced good data recovery. Id. at 2-7.

A. The Clean Air Act Requires Use of Actual Air Quality to Establish Baseline Concentrations

When Congress included the phrase "air quality data available" in the Clean Air Act, it intended that actual air quality data be used for establishing baseline and assessing increment. As noted in the Senate Report to the 1977 amendments to the Clean Air Act,

> [t]he purpose is to use actual air quality data to establish the baseline. Where sufficient actual data are not available, the state may require the applicant to perform whatever monitoring the state believes is necessary to provide that information.

S. Rep. No. 127, 95th Cong., 1st Sess. 98 (1977) (emphasis added). In the landmark case concerning the PSD program, Alabama Power, the court was clear that baseline concentration is to be determined using "actual air quality data" and expressly noted that "monitors" be used to establish baseline and assess increment. Alabama Power v. Costle, 636 F.2d 323, 374-76 (D.C. Cir. 1979).

B. EPA Guidance Supports Use Of Monitored Data For Assessing Increment Consumption

EPA has long supported establishing baseline concentrations through monitoring. According to EPA, in its first proposed rulemaking regarding PSD, baseline concentrations may be "measured" using monitoring. See 38 Fed. Reg. 18986, 18995 (July 16, 1973). EPA reiterated this position in 1974 in approving PSD requirements into state implementation plans, stating that "baseline concentration" may be established using "monitoring" as the method of analysis. See 39 Fed. Reg. 3100, 31007 (Aug. 27, 1974). Later, in its 1980 final rules regarding the PSD program, EPA expressly noted "the statutory requirement to use monitoring data to establish baseline concentration." See 45 Fed. Reg. 52676, 52717 (Aug. 7, 1980). Further, in EPA's often-cited New Source Review Workshop Manual, the agency states:

> [t]he assessment of existing ambient concentrations may be done by evaluating monitoring data. It is generally preferable to use data collected within the area of concern; however, the possibility of using measured concentrations from representative "regional" sites may be discussed with the permitting agency.

USEPA Draft New Source Review Workshop Manual (October 1990) at C.18 (emphasis added).

EPA also has supported that assessment of increment consumption may be accomplished through monitoring. In proposing amendments to the PSD program in 1979, EPA stated:

> EPA agrees that monitored ambient data is valuable for such purposes as validating and refining models and, in some cases, providing a direct measure of

> increment consumption. In accordance with the court's opinion [in Alabama Power] EPA plans to place greater emphasis on the development and use of monitoring data.

44 Fed. Reg. 51924, 51944 (Sept. 5, 1979) (emphasis added). Even in its modeling guidance included in Appendix W of 40 C.F.R. Part 51, EPA reiterates this position where it states:

> There are instances where the performance of a recommended dispersion modeling technique by comparison with observed air quality data may be shown to be less than acceptable. Also, there may be no recommended modeling procedure suitable for the situation. In these instances, emission limitations may be established solely on the basis of observed air quality.

40 C.F.R. Part 51 Appendix W. at 11.1 (emphasis added). Accordingly, Congress, the courts, and EPA have been clear that use of monitoring data is appropriate in establishing baseline concentrations and in assessing increment consumption.

C. Use Of Monitored Data Is Particularly Appropriate Given The Unique Nature Of This Evaluation

The purpose of this evaluation is merely to determine whether ambient concentrations of SO_2 in the Class I areas have increased beyond those "increments" allowed under the Clean Air Act (i.e., has there been actual significant deterioration in air quality). This is not a prospective permitting proceeding. In the permitting context, it is necessary to use a model to predict emissions because emission sources have not been constructed. Modeling is the only way to assess, prospectively, whether a new source will have consequential impacts on air quality. However, in the context of the present evaluation--the State of North Dakota's periodic review of the adequacy of its State Implementation Plan--the question is whether the North Dakota SIP has been adequate to prevent significant deterioration in North Dakota's Class I areas. There is no need to predict emissions from yet to be built sources; that has already been done during the permitting of those sources which, in the case of North Dakota, were already certified to be in compliance with PSD requirements. All that is required here is the factual determination of whether ambient concentrations of SO_2 have increased beyond allowable levels. The

best evidence, and only "actual air quality data" to make such a determination, is that from the ambient air monitors located in the Class I areas.

North Dakota's proceeding is the first "periodic review" of a State Implementation Plan for assessment of compliance with increment requirements. The Clean Air Act does not specify, and EPA has never promulgated any regulations that specify, how such a periodic review should be undertaken. Under the Clean Air Act the state, not EPA, has the primary responsibility and authority for implementation of the PSD program—including choosing how to conduct a "periodic review" of its State Implementation Plan. Even EPA, in its May 2002 comments to the state conceded, "EPA agrees that management of the consumption of allowable increment is a state decision." EPA Comments on North Dakota Department of Health's Proposed Determination Regarding the Adequacy of the SIP to Protect PSD Increments for Sulfur Dioxide, at 8. See also, Testimony of Richard Long, App. Ex. 2, at 88 ("EPA believes that this [North Dakota's PSD program] is a delegated program and that the states have the primary responsibility for managing the increment.").

Section 101(a)(3) of the Clean Air Act declares, "the prevention and control of air pollution at its source is the primary responsibility of states and local governments." Congress carefully articulated its intention that the states, not EPA, administer the PSD program. As noted in the House Report that accompanied the PSD amendments to the Clean Air Act in 1977:

> The significant deterioration review and permit process will be a state responsibility [and the purpose of the PSD amendments is] to give the states the authority to implement these measures, to limit EPA's authority to add new requirements, and prevent EPA from interfering with a state which is properly implementing these measures . . . .

H. Rep. No. 294, 9th Cong., 1st Sess., (1977) pp. 144-145. As noted by one court:

> The Clean Air Act is an experiment in federalism, and the EPA may not run roughshod over the procedural prerogatives that the Act has reserved to the states . . . especially when, as in this case, the agency is overriding state policy.

Bethlehem Steel Corp. v. EPA, 742 F.2d 1303, 1336-37 (7th Cir. 1984). EPA's draft report favors modeling over use of actual monitoring data. Nothing in the Clean Air Act allows EPA to ignore the Clean Air Act's mandate to consider actual air quality data or the state's determination, based on SO_2 monitoring of the Class I areas, that the State Implementation Plan is adequately preventing significant deterioration. To ignore this data and use a computer-based model to conclude to the contrary is arbitrary and capricious.

IV. Monitored Ambient Concentrations Of Sulfur Dioxide In North Dakota's Class I Areas Demonstrate That North Dakota's SIP Is Not Substantially Inadequate And SO_2 Concentrations Are In Compliance With Increment Requirements

Data from the ambient monitors located in North Dakota's Class I areas indicate that there has been no increase in ambient SO_2 concentrations in those areas. See SO_2 Monitoring Report, App. Ex. 4, at 7-8. Figure 14 of the SO_2 Monitoring Report demonstrates that measured SO_2 concentrations in the Theodore Roosevelt National Park North Unit have decreased dramatically on a twenty-four hour basis, over the past twenty years. Figure 14 also demonstrates that there has been no increase in ambient concentrations in Theodore Roosevelt National Park South Unit on a twenty-four hour basis. Figure 15 of the SO_2 Monitoring Report demonstrates that measured SO_2 concentrations in the Theodore Roosevelt National Park North Unit have decreased dramatically on a three-hour basis, over the past twenty years. See App. Ex. 4. Figure 15 also demonstrates that there has been no increase in ambient concentrations in Theodore Roosevelt National Park South Unit on a three-hour basis. See also, Evaluation of 2003 Dispersion Modeling Analyses of PSD Class I Increment Consumption In North Dakota and Eastern Montana, App. Ex. 3, at § 1 (noting "all trends previously identified for actual measured SO_2 concentrations in Theodore Roosevelt National Park are confirmed and continued on the basis of 2002 monitoring results."). These unchallenged facts

remain the answer to the question at issue. There simply is no evidence of significant deterioration in North Dakota's Class I areas.

A. There Is No Air Quality Data Or Evidence To Support That Ambient Concentration Levels Of SO_2 In Class I Areas Were Substantially Lower In 1976-77 Than They Were In 1980-81

Contrary to EPA's refusal to consider monitoring data because such data does not exist for 1976-77, monitored data from 1980 and 1981, just a few years after the SO_2 baseline date, constitutes the best available evidence of baseline concentrations and North Dakota's SO_2 air quality trends. North Dakota law, NDAC 33-15-15--01.1.d(1)(a), includes in the baseline concentration "actual emissions representative of sources in existence on the applicable minor source baseline date." (Emphasis added). There are absolutely no actual air quality data from ambient monitors, emissions tests, or CEM data to support that ambient SO_2 concentrations in 1980 and 1981 are significantly different from 1976 and 1977, or that 1980 and 1981 measured emissions are not representative of sources in existence during those years.

More specifically, there is no evidence to support that the ambient concentrations in the North Unit, on a 24-hour basis, were more than five times lower in 1976-77 than they were in 1980-81, which is what EPA would need to establish to show increment consumption above the 5 microgram per cubic meter threshold when compared to the most recent full year of monitored data. See SO_2 Monitoring Report, App. Ex. 4, at 8; See also Testimony of John Sandstedt, App. Ex. 2, at 548-552. Similarly, there is no evidence to support that the ambient concentrations in the South Unit, on a 24-hour basis, were more than two times lower in 1976-77 than they were in 1980-81 to show increment consumption above the 5 microgram per cubic meter threshold, when compared to the most recent full year of monitored data. See SO_2 Monitoring Report, App. Ex. 4, at 8; See also Testimony of John Sandstedt, App. Ex. 2, at 548-552. Again, there is no evidence to support such a finding.

With respect to the 3-hour standard, there is no evidence to support that the ambient concentrations in the North Unit were more than 80 times lower, and in the South Unit

more than four times lower, in 1976-77 than in 1980-81, which is what EPA would need to establish to show increment consumption above the 25 microgram per cubic meter threshold when compared to the most recent full year of monitored data. See SO_2 Monitoring Report, App. Ex. 4, at 8; See also Testimony of John Sandstedt, App. Ex. 2, at 548-552. Thus, evidence, common sense, and North Dakota law all support that twenty years of ambient data from the State's Class I areas demonstrate that ambient concentrations of sulfur dioxide have not increased since the baseline date above the specified "increment" allowed under the Clean Air Act.

B. Monitoring Data Proves that EPA's Modeling Results are Inaccurate

In addition to the trends noted above, which document an improvement in air quality, the extensive monitoring data collected to date further demonstrates the inaccuracy of the results in EPA's draft modeling report. As noted above, the relevant second-highest measured 3-hour concentration of SO_2 during the entire year of 2002 was 24 $\mu g/m^3$—below the 25 $\mu g/m^3$ 3-hour increment allowance. See Evaluation of 2003 Dispersion Modeling Analyses of PSD Class I Increment Consumption In North Dakota and Eastern Montana, App. Ex. 3, at § 1. This fact alone--that it is impossible to show an increment violation based on actual measured concentrations in the Class I areas--supports the flawed and inaccurate nature of EPA's draft modeling report. Similarly, EPA's modeling analysis shows the second highest 24-hour SO_2 concentration in Theodore Roosevelt National Park to be 11 $\mu g/m^3$. The second highest actual measured 24-hour concentration in Theodore Roosevelt National Park's North and South Units in 2002, however, was only 8 $\mu g/m^3$. Thus, to show increment consumption of 11 $\mu g/m^3$, the baseline concentration would need to be *below* zero to account for the second highest measured concentration of 8 $\mu g/m^3$ for EPA's draft modeling to be correct. See Testimony of Robert Connery, App. Ex. 1, at 100 ("shouldn't EPA at least be questioning modeling that shows that the baseline has to be below zero . . . . when your model shows you that there is a violation and you know its dead wrong because it's showing levels below zero, you ought to at least question your model."). Thus, comparison of EPA's draft modeling with real measured concentrations demonstrates the inaccuracy of EPA's draft modeling.

C. Additional Evidence Supports The Finding, As Established By Monitoring Data, That Sulfur Dioxide Concentrations Have Not Increased Above Allowable Increment

Substantial evidence supports that SO_2 concentrations have not increased above allowable increment. This evidence includes testimony by NDDH regarding baseline emission sources that have shut down and thereby expanded available increment. See Testimony of Terry O'Clair, App. Ex. 2, at 15. These sources included the Neal Station, Royal Oak Briquette, MDU Beulah, and Flying J Refinery facilities. Id. NDDH also testified that other baseline sources have reduced emissions since the baseline period further expanding available increment. Id. These include sources such as the Amerada Hess facility and the Lignite gas processing plant. Id. NDDH also testified regarding the reduction of SO_2 emissions from baseline oil and gas wells located near North Dakota's Class I areas. Id. This testimony was further supported by Ron Day of the North Dakota Petroleum Council who testified that following the baseline period, the oil and gas industry "invested hundreds of millions of dollars in abatement and elimination of SO_2 emissions in western North Dakota." Testimony of Ron Day, App. Ex. 2, at 596-597. See also, App. Ex. 7 (NDDH's Final Baseline Emission Rate Report), and Testimony of Terry O'Clair, App. Ex. 1, at 15-17.

Evidence supporting that SO_2 concentrations have not increased above allowable increment also includes the fact that the Anaconda Copper Smelter, which was at one time reportedly the second largest source of SO_2 emissions in North America and emitted more SO_2 than all of the utilities in North Dakota combined, ceased operations in the early 1980s. Included as App. Ex. 9 is a copy of a Montana Air Quality Data and Information Summary for 1979-1980 that indicates that emissions from the Anaconda Copper Smelter for just a six-month period in 1980 were 126,642 tons, or more than twice the current *annual* emissions from all of North Dakota's increment consuming utilities (non-baseline units) combined.

That SO_2 concentrations have decreased also is supported by the fact that more than 95% of the measurements for the Theodore Roosevelt National Park North Unit and more than 90% of the measurements for the South Unit are below the minimum detectable levels.

See Evaluation of 2003 Dispersion Modeling Analyses of PSD Class I Increment Consumption In North Dakota and Eastern Montana, App. Ex. 3, at § 1. This is particularly striking when considering EPA's testimony about "significant background sources over the Canadian border that may influence [North Dakota's] monitored sites." Testimony of Richard Long, App. Ex. 2, at 107. Thus, even with SO_2 emissions from Canada, surrounding states, mobile sources, baseline emissions sources, and increment consuming sources, most days there is not any measurable concentration of SO_2 in Theodore Roosevelt National Park.

Finally, that SO_2 concentrations have not increased above allowable increment also is supported by the findings of the Federal Land Managers for the North Dakota Class I areas who have certified that all major sources constructed in the state in the last twenty years do not cause significant deterioration to the Class I areas and that "air quality in North Dakota has actually improved." See Final Certification of No Adverse Impact on Theodore Roosevelt National Park and the Wilderness Portion of Lostwood National Wildlife Refuge, 47 Fed. Reg. 41480-01 (Sept. 20 1982); Final Certification of No Adverse Impact on Theodore Roosevelt National Park, 49 Fed. Reg. 38197-02 (Sept. 27, 1984); Final Determination to Extend Certification of No Adverse Impact on Theodore Roosevelt National Park and Lostwood Wilderness Area, 50 Fed. Reg. 7658-04 (Feb. 25, 1985); Final Certification of No Adverse Impact on Theodore Roosevelt National Park and Lostwood Wilderness Area, 58 Fed. Reg. 13639-01 (Mar. 12 1993). Since such determinations, SO_2 emissions in North Dakota have decreased significantly, as have measured SO_2 concentrations in the Class I areas. See Testimony of Terry O'Clair, App. Ex. 1, at 10-20, SO_2 Monitoring Report, App. Ex. 4, at 8; Testimony of John Sandstedt, App. Ex. 2, at 548-552; and Annual SO_2 Emissions in North Dakota, App. Ex. 5.

D. Draft Modeling Conducted By NDDH And ENSR Supports The Finding, As Established By Monitoring Data, That Sulfur Dioxide Concentrations Have Not Increased Above Allowable Increments

Recent modeling conducted by ENSR Corporation and NDDH support the finding, as established by monitoring data, that sulfur dioxide concentrations have not increased above the allowable increment. NDDH's modeling, as described in the Department's

May 2003 report indicates no violation of the PSD allowable increments for SO_2 for the 3-hour and 24-hour standards. See App. Ex. 11. Similarly, recent modeling conducted by ENSR, and described in the testimony of Robert Paine, also indicates no violation of the PSD allowable increment for the 3-hour and 24-hour standards. See App. Ex. 1, at 227-274.

As explained in the June 13, 2003 testimony of both George McVehil and Robert Paine, of all the increment modeling conducted to date, the recent ENSR modeling is technically superior when considering ENSR's use of the RUC2 meteorological data which represents an improved and more realistic definition of mesoscale meteorology than used by either EPA or NDDH, and when considering ENSR's validation analysis which demonstrates a better correlation of predicted to observed concentrations than the modeling conducted by NDDH and EPA. See Testimony of George McVehil, App. Ex. 1, at 313-328, and testimony of Robert Paine, App. Ex. 1, at 227-274. While all modeling evidence must be weighed by the weaknesses inherent to CALPUFF modeling, to ignore this additional evidence, which is consistent with the trends of the monitoring data, and find that North Dakota's State Implementation Plan is substantially inadequate to prevent significant deterioration, would be arbitrary and capricious.

V. Conclusion

Draft modeling conducted by EPA is fraught with flaws, is not valid or accurate evidence of SO_2 concentrations in Class I areas, and does not support a finding of increment consumption above allowable increments in North Dakota and Eastern Montana Class I areas. Under the Clean Air Act, increment consumption determinations are expressly required to be based on "available air quality data." The only actual air quality data available regarding ambient concentrations of SO_2 in North Dakota's Class I areas is from SO_2 monitors located in those Class I areas. This air quality data includes thousands of actual measurements of the air in the Class I areas, over more than 20 years. The data conclusively demonstrates that ambient concentrations of SO_2 in North Dakota's Class I areas have not increased since the baseline period, much less consumed the additional increment available for growth under the Clean Air Act. Accordingly, all

available air quality data indicates that ambient concentrations of sulfur dioxide in North Dakota's Class I areas have not increased above the increments allowed under the Clean Air Act and EPA's draft modeling report does not provide valid or accurate evidence that there has been a violation of the Class I increments for SO_2 or that North Dakota's State Implementation Plan has been substantially inadequate to prevent significant deterioration.

Sincerely,

James A. Mennell

c. Mary Jo Roth